

NAME: _____

DATE: _____

AP CALCULUS Worksheet – Evaluating Definite Integrals

1) $\int_0^1 2x \, dx$

2) $\int_{-1}^0 (x - 2) \, dx$

3) $\int_{-1}^1 (t^2 - 2) \, dt$

4) $\int_0^1 (2t - 1)^2 \, dt$

5) $\int_1^2 \left(\frac{3}{x^2} - 1\right) \, dx$

6) $\int_{-1}^1 (t^{1/3} - 2) \, dt$

$$7) \int_{-1}^0 (t^{1/3} - t^{2/3}) dt$$

$$8) \int_{-1}^4 |2x - 4| dx$$

$$9) \int_0^\pi (1 + \sin x) dx$$

$$10) \int_{-\pi/6}^{\pi/6} (\sec^2 x) dx$$

$$11) \int_{-\pi/3}^{\pi/3} (4 \sec \theta \tan \theta) d\theta$$

12) What is the exact area of the region between $y = x - x^2$ and the x -axis, over the interval $[0, 1]$?

13) What is the exact area of the region between $y = \cos x$ and the x -axis, over the interval $\left[0, \frac{\pi}{2}\right]$?

For #14 – 19: Suppose that f and g are continuous functions with the below given information, then use the properties of definite integrals to evaluate each expression.

$$\int_1^2 f(x) dx = -4, \quad \int_1^5 f(x) dx = 6, \quad \int_1^5 g(x) dx = 8$$

14) $\int_2^5 g(x) dx$

17) $\int_2^5 f(x) dx$

15) $\int_5^1 g(x) dx$

18) $\int_1^5 [f(x) + g(x)] dx$

16) $\int_1^2 3 f(x) dx$

19) $\int_1^5 [4 f(x) - g(x)] dx$

For #20 – 26: Suppose that f and g are continuous functions with the below given information, then use the properties of definite integrals to evaluate each expression.

$$\int_1^9 f(x) dx = -1, \quad \int_7^9 f(x) dx = 5, \quad \int_7^9 h(x) dx = 4$$

20) $\int_9^1 f(x) dx$

24) $\int_7^9 [f(x) + h(x)] dx$

21) $\int_1^7 f(x) dx$

25) $\int_7^9 [2f(x) - 3h(x)] dx$

22) $\int_9^7 [h(x) - f(x)] dx$

23) $\int_1^9 -2f(x) dx$